

## Chapter 7

## CONSOLIDATION AND UNITIZATION FOR SHIPMENT AND USE OF CARGO CONTAINERS

### CONSOLIDATION AND UNITIZATION FOR SHIPMENT

Consolidation is the bringing together of like or unlike items for shipment. Once the items are assembled, they must be kept together as a single unit until they reach a break-bulk point or the ultimate consignee. Unitization results in economy through reduction in handling and documentation, one unit taking the place of several units.

#### ADVANTAGES

Figure 7-1 gives advantages of unitizing loads which are as follows:

- Eliminates laborious and expensive manual handling of individual items.
- Reduces damage to items by eliminating manual handling.
- Permits savings in handling costs.
- Reduces personnel accidents by eliminating manual handling and lifting.
- Simplifies inventorying and reduces inaccuracies.
- Utilizes storage heights not possible by manual means.

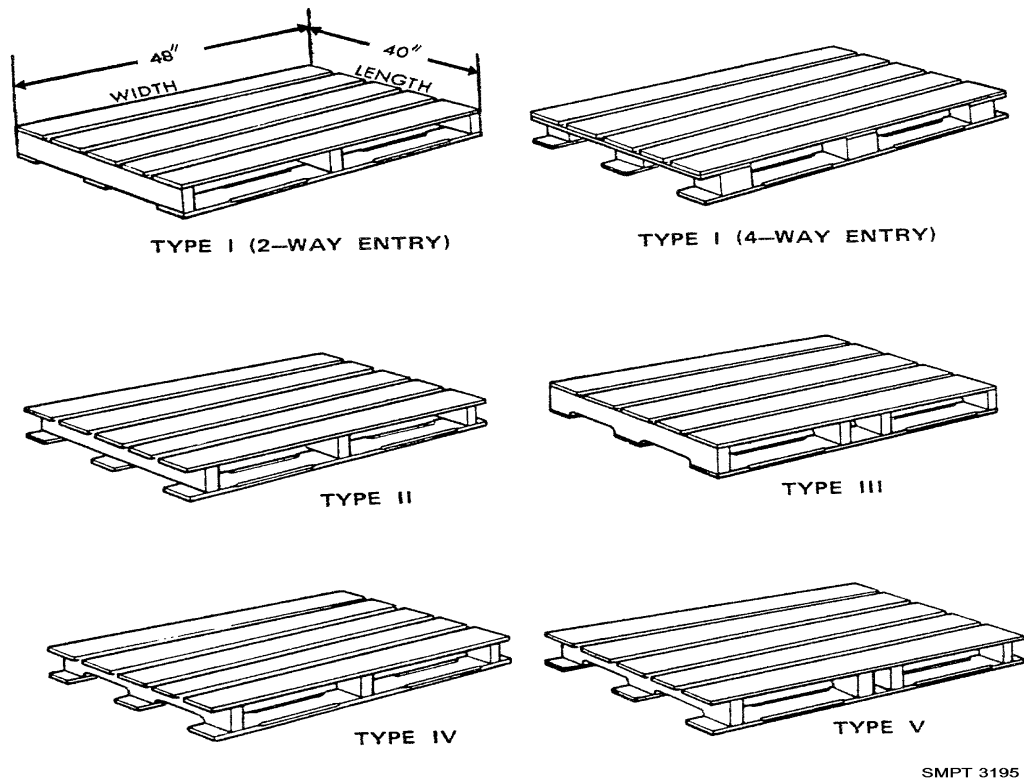


Figure 7-1. Advantages of cargo unitization.

- Reduces pilferage because of unitization of items by steel straps and other bonding methods.
- Permits faster movement of supplies and equipment. Reduces marking requirements on individual containers.

#### **METHODS OF UNITIZATION**

The two basic forms of unitization are--

- Palletization. Palletization is the placing of a number of packages on a low, portable platform constructed of wood, metal, or fiberboard, or a combination of these materials.
- Containerization. Containerization is the placement of a number of packages into a intermodal container, which not only reduces the number of units and documentation, but provides additional protection to the packages.

#### **PALLETIZING UNIT LOADS (MIL-HDBK-774)**

MIL-HDBK-774 gives the palletized unit load requirements for Department of Defense material using the pallets discussed in Chapter 3. The standard establishes loading patterns for various types of commodities, listing the pattern for stacking containers and the methods of unitizing to be used.

#### **TYPES OF PALLETS**

- NN-P-71. Types I (2-way entry), and III of NN-P-71 are intended for use in storage operations. Types IV and V of NN-P-71 are for use in storage and shipment worldwide regardless of mode of transportation.
- MIL-P-15011. Type I (4-way entry) of MIL-P-15011 should be used for the palletization of military supplies whenever 4-way entry is required in the storage and distribution system and in support of NATO forces. Nonstandard 4-way entry 40- by 48-inch pallets should be reused for the storage and shipment of materiel to CONUS consignees. (fig 7-2)

#### **Limitations**

The following size and weight limitations apply to the complete load including the pallet and the bonding and storage aids (fig 7-3).

Unless otherwise specified by the procuring activity, load units prepared for shipment in MILVANs and SEAVANs shall not exceed 40 inches in length. All other loads shall not exceed 43 inches in length, which permits an overhang of 1 1/2 inches at each end of the pallet.

Unless otherwise specified by the procuring activity, load units prepared for shipment in MILVANs and SEAVANs shall not exceed 48 inches in width. All other loads shall not exceed 52 inches in width, which permits an overhang of 2 inches at each side of the pallet.

## ADVANTAGES OF CARGO UNITIZATION LOADS

ECONOMY

GREATER SPEED IN  
HANDLING

DECREASED DAMAGE  
TO MATERIAL

SAFETY

LESS CHANCE FOR  
PILFERAGE

PROTECTS AGAINST  
ENVIRONMENTAL  
CONDITIONS

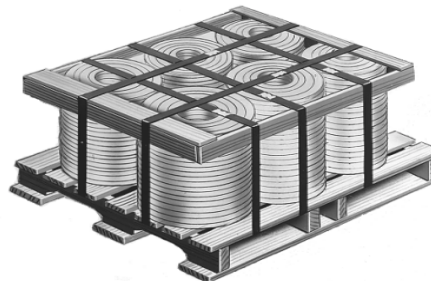
UTILIZATION OF  
SPACE



TRIPLE-WALL FIBERBOARD



WAREHOUSE STORAGE



PALLETIZED LOAD

SMPT 1920A

Figure 7-2. Types of pallets.

Load units prepared for shipment in containerization media such as SEAVANs, etc. shall not exceed 43 inches in height and in MILVANs, 41 inches. All other loads shall not exceed 54 inches in height, except as permitted for loads of compressed gases in cylinders.

The maximum gross weight of a load shall not exceed 3,000 pounds per single pallet load for domestic, intercoastal, or overseas shipments.

### TYPES OF PALLETIZED LOADS

Types of supplies that can be palletized are--

- Items which are identical and identified by the same stock number.
- Items uneconomical or impractical to pack.
- Rugged and durable items that require minimum physical protection.
- Boxed items uniform in size requiring additional protection.
- Items that are moved in large quantities.

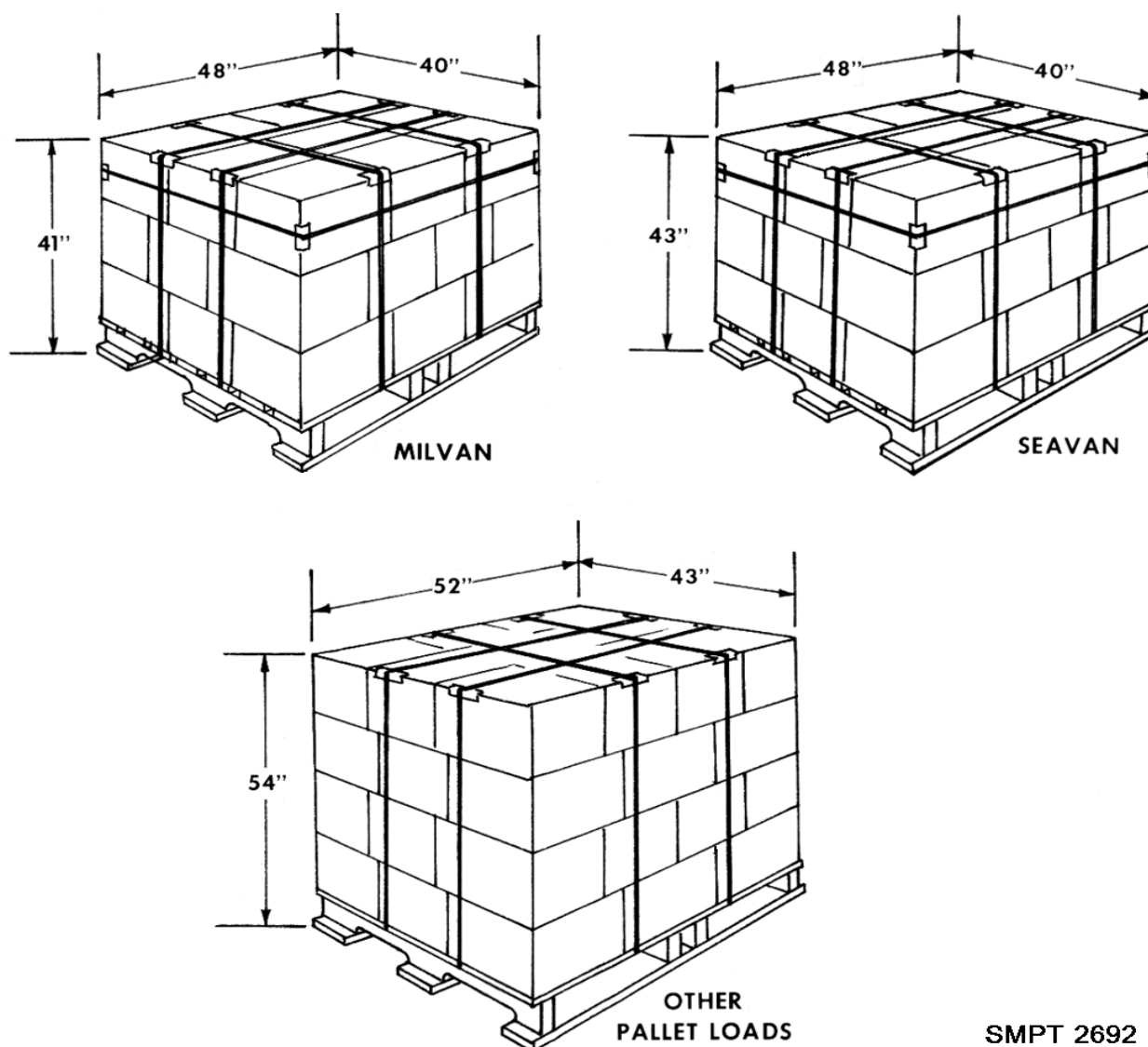


Figure 7-3. Pallet size limitations.

**LOAD ARRANGEMENT**

The arrangement of items to the pallet must provide a rigid, compact, uniform size load, strongly secured to prevent shifting, and capable of resisting impact, vibration, racking, and compression encountered during handling, storage, and shipment. Basic principles for arranging and securing loads to pallets are--

- Items should be interlocked, nested, or bundled whenever possible.
- The load pattern should eliminate or reduce void space.
- Wood separators or spacers are placed in voids between rows and layers of irregular-shaped items to insure a firm and stable load.

The top surface of the loading pallet must be level, or made level for stacking purposes. This can be accomplished by applying a wood top frame or leveling boards with a supporting framework.

Loads difficult to stabilize or which are compressible and not sufficiently firm to support superimposed loads, will be reinforced with a supporting framework.

Boxed items are arranged on the pallet so that the markings on individual containers do not show on two adjacent sides of the palletized load. This will provide clear areas for unit load marking.

The load is secured to the pallet, using ASTM D 3950 requirements for applying lengthwise and crosswise strapping. Horizontal strapping is the width and thickness size as the tie-down strap size. The gross weight of the load, divided by the total number of tie-down straps to be used, determines the weight which must be borne by each strap. Non-metallic strapping is not authorized for the strapping of palletized loads of wooden, plywood, or metal shipping containers.

Strapping is applied in a manner that will eliminate any possibility of slippage. Wood cleats, tie blocks, or braces are used under straps when necessary to insure stability or to bridge unsupported spans.

### Loading

To properly load a pallet, consideration must be given to the type of item, its weight, and destination. It is recommended that MIL-HDBK-774 be followed when loading 40- by 48-inch pallets. Figure 7-4 shows one type of palletized load illustrated in the standard.

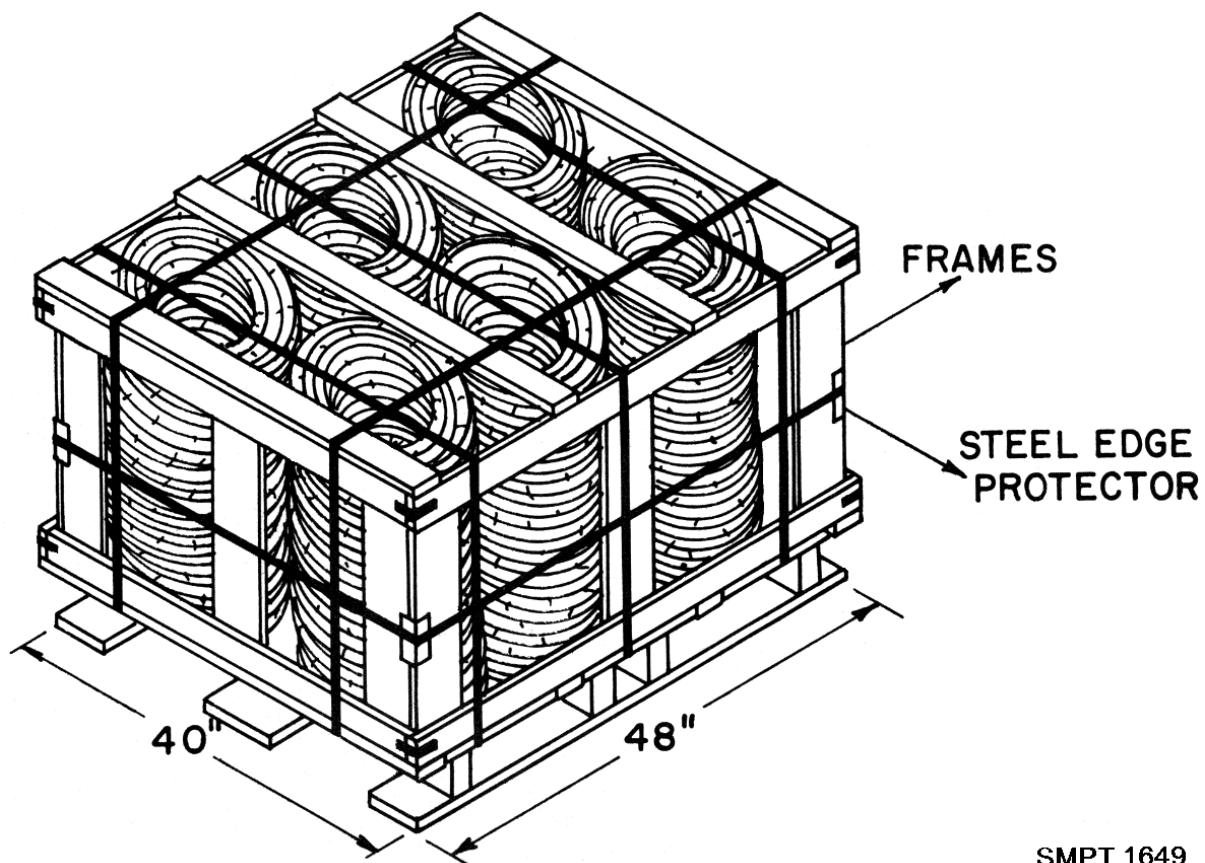


Figure 7-4. Examples of palletized load.

## **SHRINK FILM AND STRETCH FILM PALLETIZATION**

### **SHRINK FILM**

Plastic films such as polyethylene are now being used in accordance with the requirements of MIL-HDBK-774 as a means of bonding palletized loads. The plastic film is stretched in the manufacturing process; this is called "orientation". The stretched film shrinks when subjected to a controlled flow of heat air. The heated air is supplied by the use of a heat shrink cannon or a shrink film chamber (fig 7-5). The heat causes the film to shrink, conforming to the contour of the load. For this reason, it can be used for pallet loads containing a variety of items which form irregular shaped configurations that could not be palletized by conventional means. The tightly adhering film immobilizes the contents and provides stability. It also provides some weather protection for exposed cargo. Shrink film palletization provides a reduction of labor and material cost by the use of automatic equipment and eliminates the problem of damage caused by strapping containers too tight.

### **Stretch Film**

Stretch films can be used as a means of bonding palletized loads for many commodities shipped in the Continental United States (CONUS) or when shipped containerized. The stretch films are polyethylene (PE), polyvinyl chloride (PVC) or ethyl vinyl acetate (EVA). The film is wrapped around the load in multiple layers from the top of the bottom deckboard to not less than two inches above the height of the load. The required thickness of the wrap is determined by the kind of film being used and the weight of the load. Additional bonding strength can be provided by placing a sheet of weather-resistant fiberboard, the same size as the top dimensions of the load, on top of the load prior to stretch wrapping.

## **CONSOLIDATION CONTAINERS (GENERAL)**

Consolidation containers may be constructed of fiberboard, paper-overlaid veneer, plywood, or lumber. They may be demountable or non-demountable. They are usually secured to a pallet base or a skid base for handling purposes. Some containers are intended to be expendable, while others are intended to be reusable. Some consolidation containers are designed to be compatible with the requirements of the 463L Materials Handling System of the Air Force. Others are designed to be used as inserts in transporters such as MILVANS, SEAVANS, or to be used as separate shipping containers.

## **BOXES, SHIPPING INSERT CONSOLIDATION, MIL-B-43666 (GENERAL)**

### **DESCRIPTION**

These boxes are constructed of wood cleated plywood, plywood wirebound, double-wall fiberboard, or triple-wall fiberboard. They are mounted on pallet-type bases for ease of handling. Their construction varies widely depending upon the materials used. The sizes are such that they are modular in concept.

### **General Use**

These boxes are intended for use as inserts in cargo transporters such as MILVANS, SEAVANS, or as separate exterior containers. They are to be used for Level A or B shipments.

### Classification

There are three types of consolidation insert containers. Type I is of wood cleated plywood construction and has two styles depending upon the style of pallet base used. Type II is of plywood wirebound construction of the pallet base. Type III is constructed of double-wall or triple-wall fiberboard. Type III has four styles depending upon the construction features of the box.

### Marking

The marking for shipment will be in accordance with MIL-STD-129.



Figure 7-5. Shrink film chamber used for heat shrinking film around palletized load.



## **TYPE I, WOOD CLEATED PLYWOOD CONSOLIDATION INSERT BOX (MIL-B-43666)**

### **DESCRIPTION**

These containers are wood cleated plywood boxes similar in construction to the PPP-B-601 cleated plywood boxes. They are provided with a four-way entry pallet base (fig 7-6).

### **USE**

These boxes may carry Type 1, 2, or 3 loads not exceeding a density of 37 pounds per cubic foot. Loads exceeding this density require additional box reinforcement. They may be used for domestic and overseas shipments. They are intended for consolidation of like and unlike stock numbered items. These containers may be used as inserts in SEAVANs or MILVANs

### **SIZE AND WEIGHT LIMITATIONS**

There are 15 sizes available in the wood cleated plywood consolidation insert containers. The outside length ranges from 29 to 86 inches. The outside width ranges from 31 3/4 to 45 inches. The outside height ranges from 20 to 52 1/2 inches. For MILVAN shipments, the overall height shall be not more than 41 inches. The weight capacity for the various sizes ranges from 1,000 to 2,600 pounds. Table I and II of MIL-B-43666 specifies the length, width, height, and weight combinations for each of the 15 sizes.

### **CLOSURE**

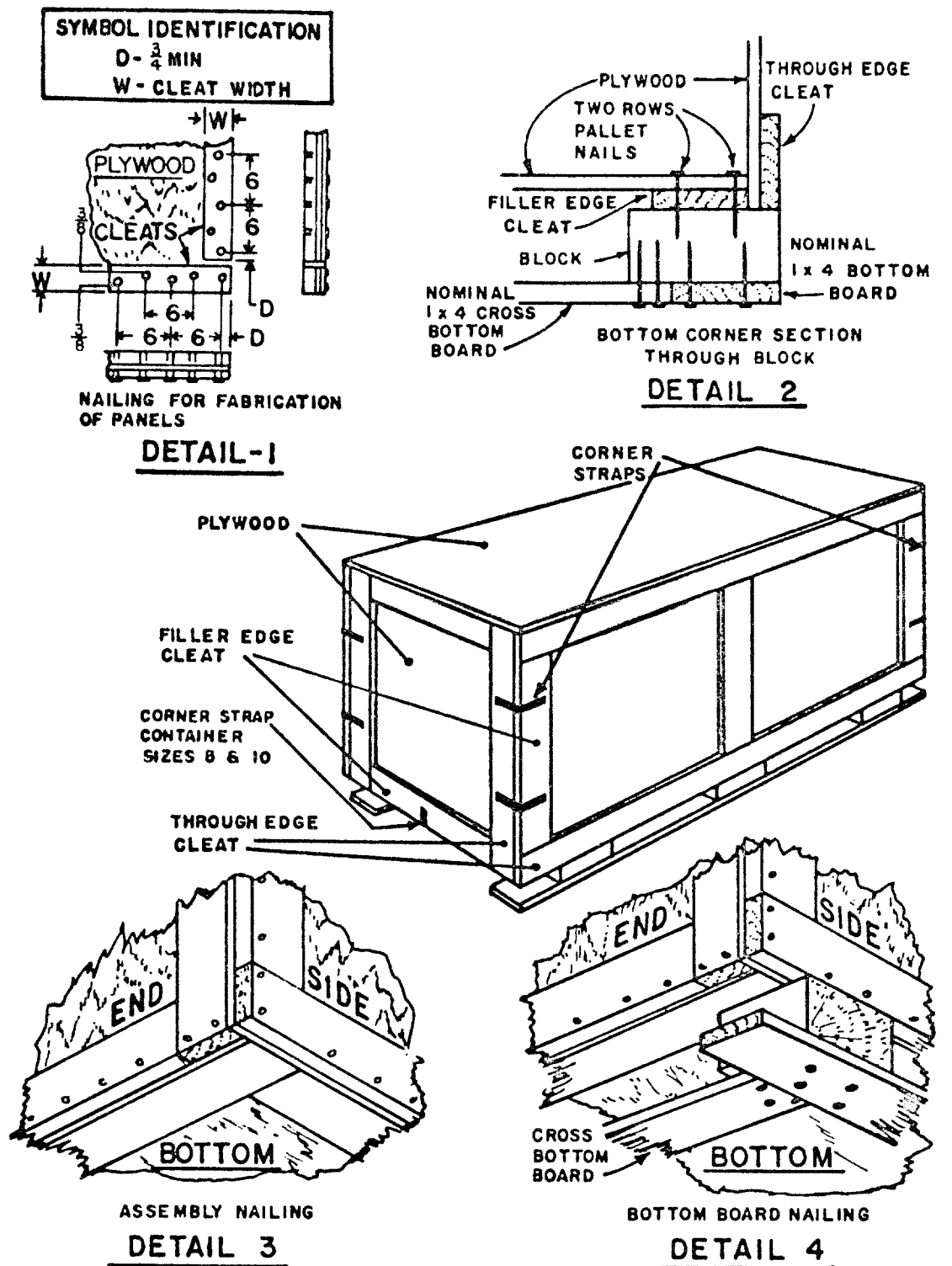
Nail the top to the top cleats of the sides and ends using sixpenny cement-coated, chemically etched, or mechanically deformed nails spaced three inches apart. Do not drive the nails into the end grain of the vertical cleats.

### **STRAPPING REQUIREMENTS**

Each vertical corner shall be reinforced with two 8-inch pieces of 3/4-inch flat steel strapping 0.023 inches thick. The strapping will be attached to the cleats with pneumatically driven galvanized staples 7/16 inches long or with 1-inch long nails pneumatically driven. As an alternate, 3/4-inch wide flat, nail-on strapping, 0.025 or 0.028-inch in thickness, may be used. This strapping, which is perforated with holes spaced 1/2 to 1 3/4 inches apart, may be secured with large headed galvanized roofing nails, zinc coated steel roofing nails, or 1-inch mechanically driven nails. Each strap will be secured with four fasteners. Two will be driven into the through cleat on the end of the box and two will be driven into the filler cleat on the side of the box.

- On boxes 41 inches high, strapping will be placed 13 to 26 inches from the top of the box.
- On boxes 20 inches high, strapping will be placed 2 and 15 inches from the top of the box.
- On box sizes 5 and 10, which are 43 inches wide, an additional strap shall be placed to the center of each corner formed by the bottom and end panels.





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Figure 7-6. Type I, Style I, wood cleated plywood consolidation box (MIL-B-43666).

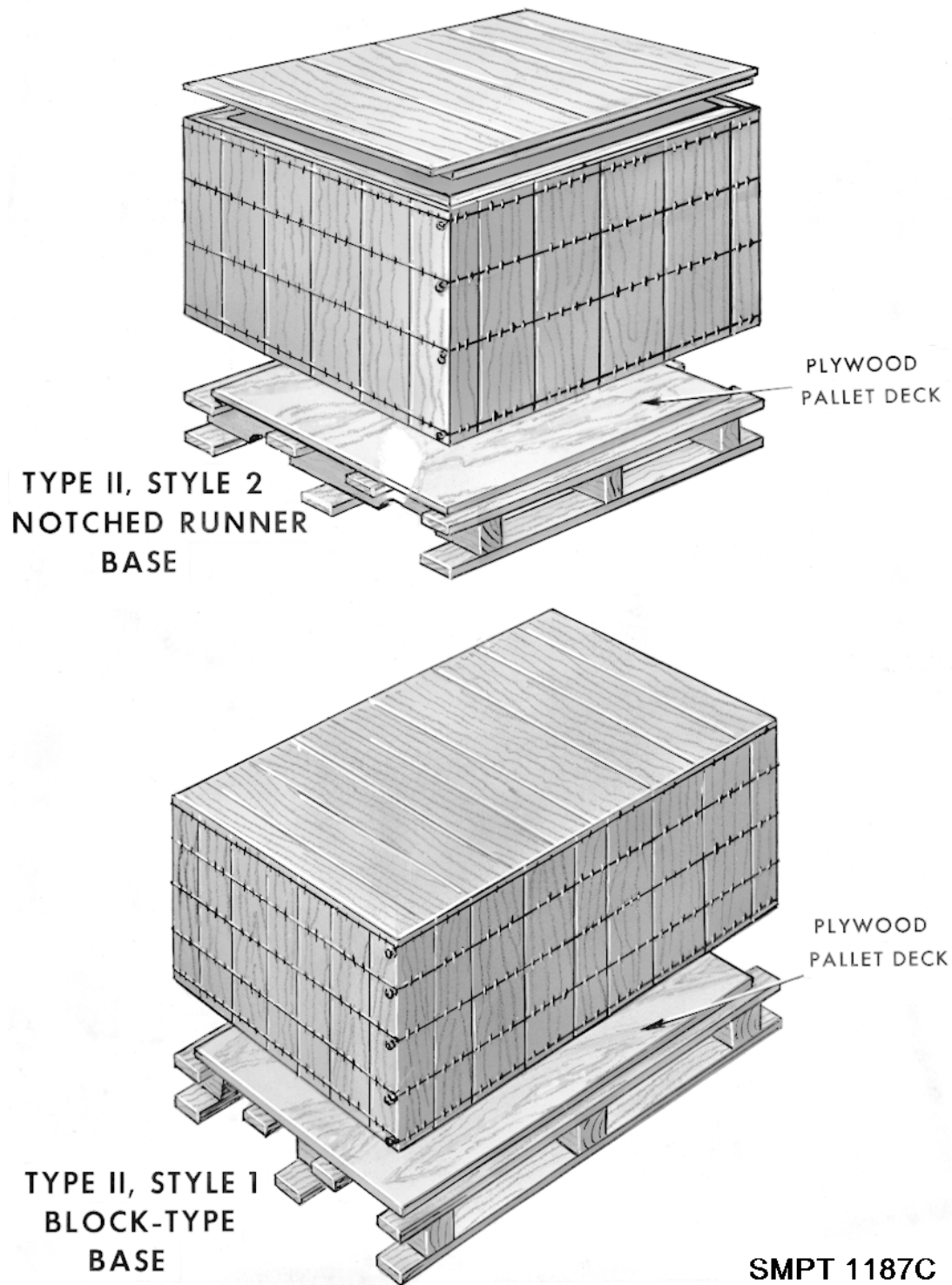


Figure 7-7. Type II, plywood wirebound consolidation boxes (MIL-B-43666).

## **TYPE II, PLYWOOD WIREBOUND CONSOLIDATION INSERT BOX (MIL-B-43666)**

### **DESCRIPTION**

The body and top of these boxes are constructed of plywood panels bound together with binding wires. The bottom panel is fabricated from 1/2-inch plywood which is secured to either a skid base or a pallet base (fig 7-7).

### **USE**

The use of Type II plywood wirebound boxes is the same as Type I wood cleated plywood boxes.

### **CLASSIFICATION**

There are two styles of boxes available under the Type II classification:

- Style 1 box utilizes a double-wing, block-type pallet base (fig 7-6).
- Style 2 box utilizes a skid base having three lengthwise skids which are cut out to facilitate side entry by forklift trucks.

### **Size and Weight Limitations**

There are several sizes available in the plywood wirebound consolidation containers. The range of outside dimensions and weight limitations are the same as those specified for the Type I, cleated plywood boxes. Tables I, and II, of MIL-B-43666 specify the length, width, and height combinations for each of the sizes.

### **CLOSURE**

After the box body is assembled by securing the wire loops with a sallee closure hand tool, or similar suitable alternate tool, and nailed to the base, make the closure by nailing the plywood top to the top cleats with threepenny nails. Space the nails 4 1/2 inches apart. Complete the closure by applying lengthwise and girthwise straps.

### **STRAPPING REQUIREMENTS**

Requirements for the size, number, and location of straps vary for each style and size of Type II containers. Consult the Appendix of MIL-B-43666 for detailed requirements for reinforcing the particular plywood wirebound container being used.

## **TYPE III, FIBERBOARD CONSOLIDATION INSERT BOX (MIL-B-43666)**

### **Description**

These boxes are made of double-wall or triple-wall fiberboard. The box design and construction differs for each of the four designated styles. Unless otherwise specified, they are furnished with a pallet base.

### **USE**

Type III fiberboard insert boxes should be restricted to MILVAN, or SEAVAN when used for level A overseas shipments. They may be used as shipping containers for Level B overseas shipments and as domestic consolidation containers. Style 3 should be used for items of assorted stock numbers to be loaded at origin as inserts only for shipment in MILVAN, and SEAVAN to a single consignee address code. Style 5 should be used for unit

loads of nonperishable subsistence as required by MIL-L-35078 and sized (in height) depending on the anticipated height of the contents.

#### CLASSIFICATION

There are four styles of boxes available under Type III classification:

- Style 3, regular slotted box (RSC), is the same as the alternate construction of the Style E ASTM D5168 fiberboard box with a 1 1/2-inch overlap of the outer flaps (fig 7-8). The box may be furnished with or without a pallet base. When a pallet base is used, it may be either a double-wing block-type or double-wing notched runner-type.
- Style 4 half slotted container (HSC) with telescoping sleeve and cap, consists of a half slotted container bottom section without top flaps, a sleeve (with stiffening flaps) which fits over the bottom section, and a top cap which extends down six inches over the sleeve (fig 7-8). The requirements for the pallet base are the same as for Style 1.

Style 5 flanged bottom tube with cap, pad, and pallet, consists of a fiberboard tube with 4-inch bottom flanges, a bottom pad, and a top cap which fits down over the body tube (fig 7-8). This type is furnished with a stringer type pallet base.

Style 6, half slotted container (HSC) with cap and pallet base, consists of a body having a regular slotted bottom and a flanged top, and a top cap (fig 7-9). Unless otherwise specified, it is furnished with a pallet base.

## CONSOLIDATION BOXES (MIL-B-43666)

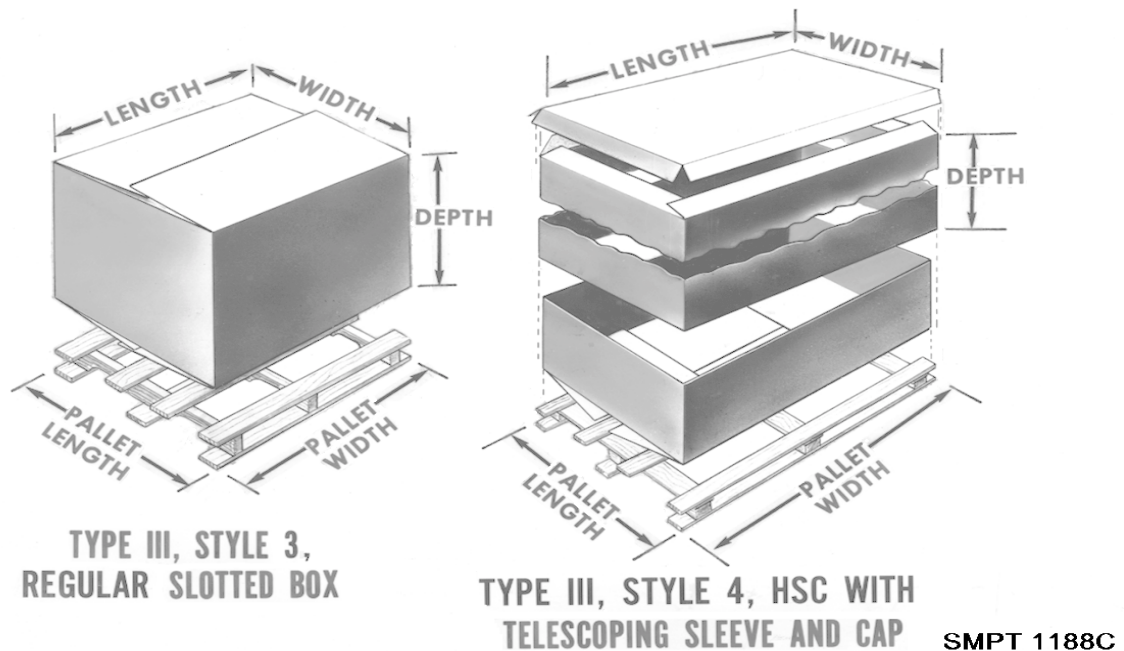


Figure 7-8. Type III, styles 3 and 4, fiberboard consolidation boxes (MIL-B-43666).

### **SIZE AND WEIGHT LIMITATIONS**

There are several sizes available in the fiberboard consolidation containers, depending upon the styles. The outside length ranges from 29 to 86 inches. The outside width ranges from 31 3/4 to 42 inches. The outside height ranges from 20 to 52 1/8 inches. The weight limit ranges from 1,500 to 2,600 pounds. Style 3 is available in sizes 1 through 10; Style 4 is available in sizes 23 and 24; Style 5 is available in sizes 16, 17, 18, and 24; and Style 6 is available in sizes 14 and 15. Tables I and II of MIL-B-43666 must be consulted for the various length, width, height, and weight combinations of each of the sizes specified for Type III boxes.

### **CLOSURE**

The closure requirements vary for each style of box. Type III boxes are constructed in accordance with Specifications ASTM D5168 and MIL-B-43666. The boxes are closed in accordance with the Appendix of the applicable specification.

### **STRAPPING REQUIREMENTS**

Either metal or nonmetallic strapping may be used to reinforce Type III boxes. Requirements for the size, number, and location of straps vary for each style and size of box. Consult the Appendix of MIL-B-43666 for the detailed requirements for reinforcing the particular style and size of fiberboard consolidation box being used.

## **PACKING CONSOLIDATION CONTAINER**

### **PROBLEMS INVOLVED IN CONSOLIDATION**

The main problem involved in consolidation of materials becomes one of shock mitigation. The packer must be skilled in placing packages in the container so that each package "wedges in" other packages. The packer must be able to block or brace the load as he progresses, in a minimum of time and with the cheapest and lightest material, yet strong enough to do the job. Essentially, the problem becomes one of converting a type 3 load to a type 2 load for protection against shock and vibration.

### **SHOCK MITIGATION**

In order to meet the problem of shock mitigation relative to consolidation containers, there are certain basic procedures to follow:

- Try to maintain level layers.
- Fill all internal voids as the load progresses.
- Keep the center of gravity low and centered by placing heavy items in the bottom portion of the container and centering them in the container as much as possible.
- Block and brace the interior load adequately to prevent movement caused by shock and vibration.

### **BLOCKING AND BRACING THE LOAD**

The ideal conditions for full utilization of consolidation containers is to tailor a container to the size of uniform interior packages. Of course, the required consolidation containers are generally of standard dimension and are not related to product package sizes.

These ideal conditions are not always present at the depot or base level, but with a variety of package sizes to place in consolidation containers most of the available space can be utilized in some instances.

Voids that occur at the top of the pack are probably the most usual (fig 7-10). In order to provide holddown media for the load, first cover the packs with pad(s) and then place cells between the pads and the container cover. The use of adhesives will hold the cells between the pads and the container cover. Cells should be located where strapping will be placed. Where feasible, the corners of the container may be split down to the top of the load and the excess portion of each side panel, above the top of the load, may be folded in, thus eliminating the need for cells.

Voids that occur at the sides of the pack can be blocked with pads and cells, the same as top blocking and bracing (fig 7-11).

Interior voids (fig 7-12) are the hardest to cope with and the most time-consuming. All voids that would permit shifting of the packages should be filled with cells or foamed-in-place materials as the layers progress. If the packages are uniform, one sleeve may fill the void for several layers or packages.

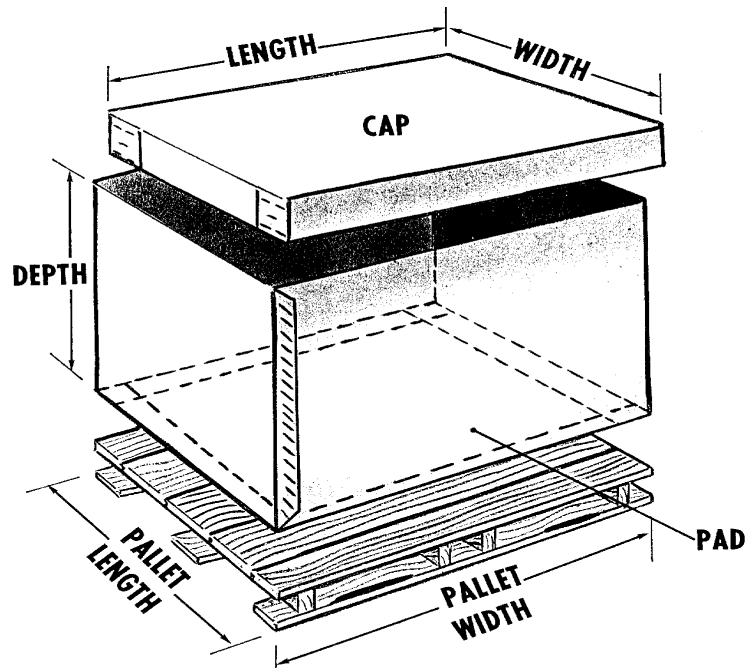
Compound voids (top and side, two sides, etc. may take a little more skill, but pads and cells can be used to block and brace the same as previously discussed.

## PACKING SEMI-PERISHABLE SUBSISTENCE ITEMS

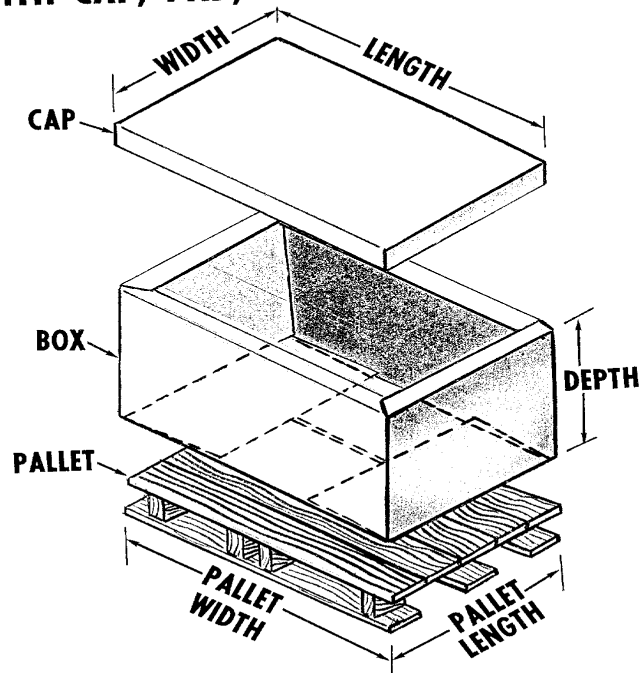
Unit loads of semi-perishable items shall be prepared in conformance with MIL-L-35078, Loads, Unit: Preparation of Semi-perishable Subsistence Items: Clothing, Personal Equipment, Equipage; General specification. This specification establishes patterns, methods, materials, and techniques applicable to the preparation of unit loads of nonperishable subsistence items by loading the shipping containers onto a pallet or within a consolidation container for shipment. The choice of unit load type and class based upon the level of protection provided can be determined from paragraph 6.1 of MIL-L-35078. Detailed specification sheets, MIL-L-35078/1 through MIL-L-35078/7, provide the requirements for each unit load type and class. The types and classes of unit loads are shown in table 7-1.

Table 7-1. Classification of unit loads of semiperishable subsistence items (MIL-P-35078)

Types	Classes
I - Palletized unit load.....	A - Strapped or film bonded. B - Capped and strapped. C - Sheathed, capped and strapped. D - Shrouded, sheathed, capped and strapped.
II - Containerized unit load.....	E - Capped and strapped fiberboard box. F - Wood cleated or wirebound, strapped plywood box.
III - Commercial load base.....	G - Palletized. H - Load base.



**TYPE III, STYLE 5, FLANGED BOTTOM TUBE  
WITH CAP, PAD, AND PALLET**

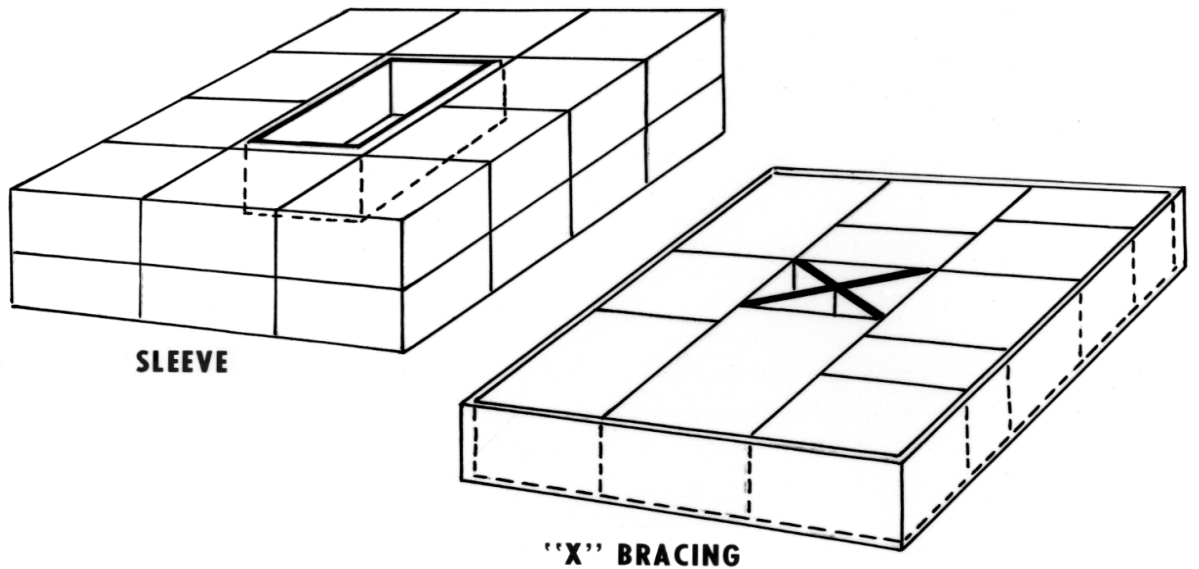


**TYPE III, STYLE 6, HALF SLOTTED CONTAINER  
WITH CAP AND PALLET BASE**

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Figure 7-9. Blocking and bracing top voids.





SMPT 925

Figure 7-10. Sleeve and X bracing.

## CARGO CONTAINERS (GENERAL)

### DEFINITIONS

The following definitions apply:

**Transporter** - A cargo container is a large shipping container in which packed or unpacked material is placed for movement to a break-bulk point or to an ultimate consignee.

**MILVAN** - The MILVAN is a Government-owned or leased noncollapsible, reusable cargo container capable of being coupled to another container of like description. It can be lifted by top or bottom corner fittings; can be used either singly or coupled together; and can be carried by highway, rail or water modes of transportation.

**SEAVAN** - A SEAVAN is a privately-owned container of various sizes and configurations which may be leased to the Government for the consolidation movement of material by highway, rail or water modes of transportation.

**Note** - Cargo that is hard to handle in closed vans, such a large, heavy or bulky items, or machinery, may be shipped in flat racks.

**AIR/LAND** - The M2 AIR/LAND container is a lightweight intermodal container that permits land and air freight transportation without rehandling of the contents. The container is 8 feet in height, 8 feet in width, and 20 feet in length. They have a gross weight capacity of approximately 45,000 pounds. The container and its contents must not exceed the structural limitations of the transporting aircraft.

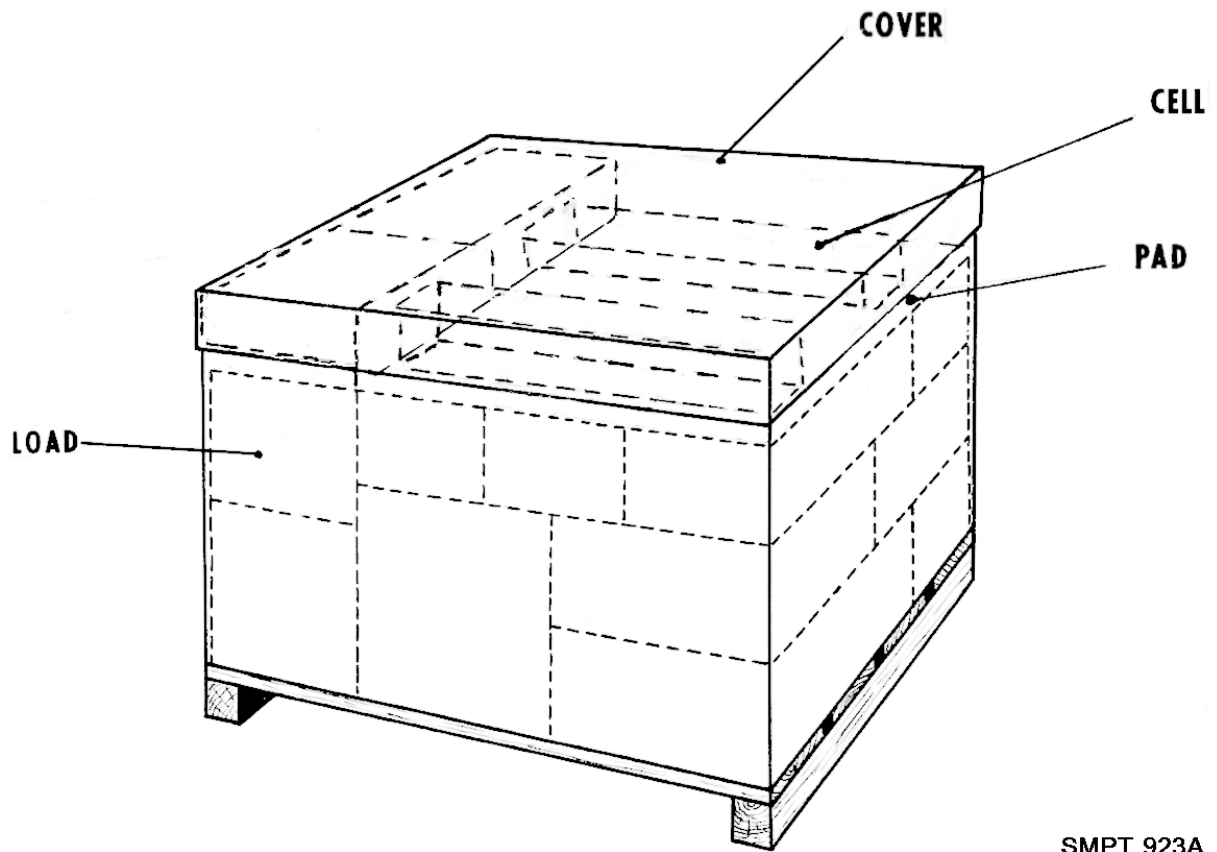


Figure 7-11. Blocking and bracing side voids.

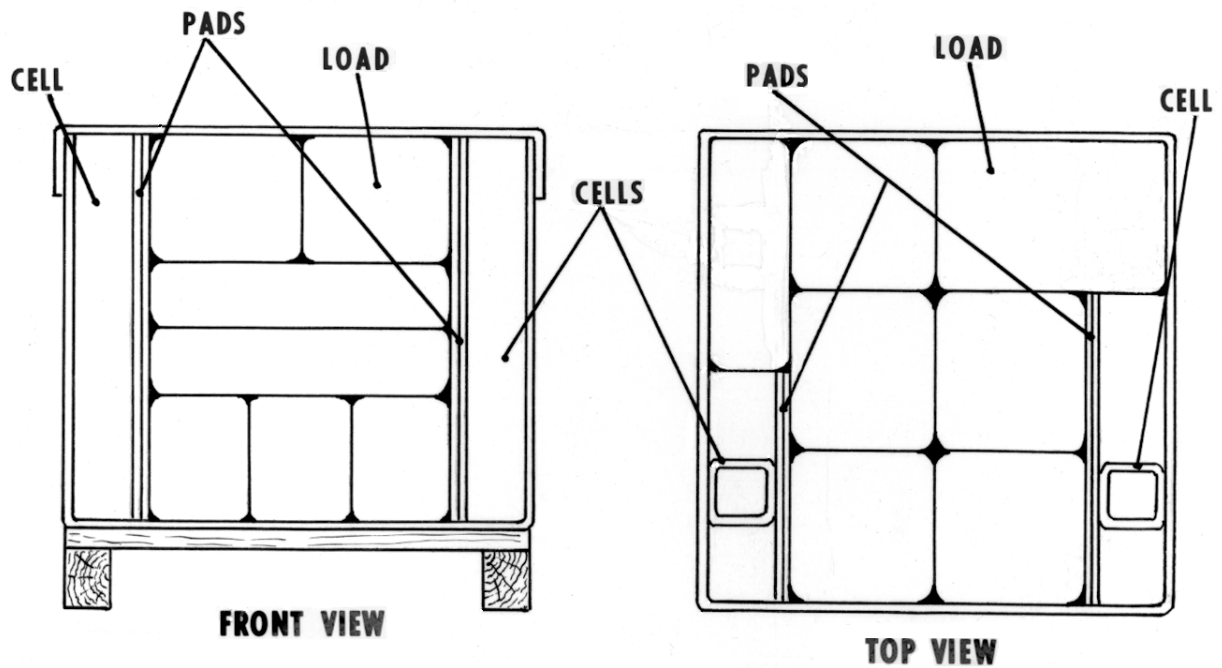


Figure 7-12. Blocking and bracing interior voids

**Stuffing** - The term "stuffing", as related to cargo containers, means the placing of cargo into cargo containers as distinguished from the process of loading containers on board ship. See MTMC Pamphlet No. 55-2 "Management and Stuffing of Containers".

## **PURPOSE AND ADVANTAGES OF LARGE CONTAINERS**

### **Purpose**

The purpose of cargo containers reduce the number of miscellaneous small package shipments to unit loads of the best possible size for the direct application of mechanical handling equipment.

### **Advantages**

The use of mechanical handling procedures increases the speed, security, accuracy, flexibility, and economy of supply and transportation operations:

- Use of cargo containers reduces the cost of handling and rehandling many small packages.
- Loss due to damage to containers and supplies during handling and shipping is reduced.
- Loss due to pilferaging and misplacement or misrouting of individual packs is reduced.
- The consolidation of packs within cargo containers reduces the need for marking and documentation of individual packs destined for one consignee.
- Savings are realized through the elimination or reduction of heavy or expensive shipping containers.

## **USE OF MILVANS AND SEAVANS**

### **DESCRIPTION OF MILVAN (MIL-C-52661)**

A MILVAN has inside dimensions of 231 inches in length, 92 inches in width, and 87 inches in height. The gross weight rating for each 20-foot container is 44,800 pounds. A MILVAN can be coupled to another MILVAN container to make a single unit 40 feet in length. A MILVAN has the capability of being moved by semitrailer tractor when used in conjunction with a tandem bogie arrangement which serves as the rear wheels. When the double doors are properly closed, the MILVAN affords waterproof protection.

### **DESCRIPTION OF SEAVAN**

SEAVANS vary from approximately 20 to 40 feet in length. The standard length utilized by the military is 40 feet. SEAVANS are 8 feet in height and 8 feet in width. They have a maximum gross weight capacity of 67,200 pounds. SEAVANS are compatible for movement by motor and rail and may be stored for shipment on specially containerized ships. They may be transported on a semitrailer chassis and are lifted easily and loaded, minus the chassis, on board by modern materials-handling equipment. There are four general types and three specialized types of SEAVANS:

#### **Dry Cargo Container**

The dry cargo container is weatherproof and is designed to protect the cargo from water. It is ideally suited for shipping items packed in domestic packs and any commodities susceptible to water damage. The dry cargo container is completely inclosed and must be loaded and unloaded by hand or forklift truck.

**Dry Cargo--canvas Top Container**

The canvas, or so-called "rag" top container, is similar to the dry cargo container, but has a removable canvas top. With the top removed, the cargo can be loaded and unloaded by crane as well as forklift. Canvas top containers are not 100 percent weatherproof; therefore, all items loaded in such containers must be in waterproof packs or otherwise be susceptible to water damage.

**Flatrack Container**

The flatrack container resembles a flatbed truck with varying styles of side bracing and corner posts and corner posts and comes in a variety of sizes. Generally, the flatrack has about two-thirds the cubic capacity of a dry cargo container, but with the same weight capacity. It is designed to carry high density and oddly shaped cargo that require little protection against the elements, although some are equipped with fabric covers. Brackets on the sides of the bed facilitate efficient tiedown or banding of heavy items to the bed of the container. Removable sides facilitate the loading and unloading by crane or forklift truck.

**Reefer (Refrigerator) Container**

Perishable cargo that must be refrigerated or frozen must be transported in a reefer. Most of the commercial reefers have standard refrigeration units that are fuel operated for road use and electrically operated for storage or ocean transit. The standard container can refrigerate or freeze from ambient temperature to -10 degree Fahrenheit.

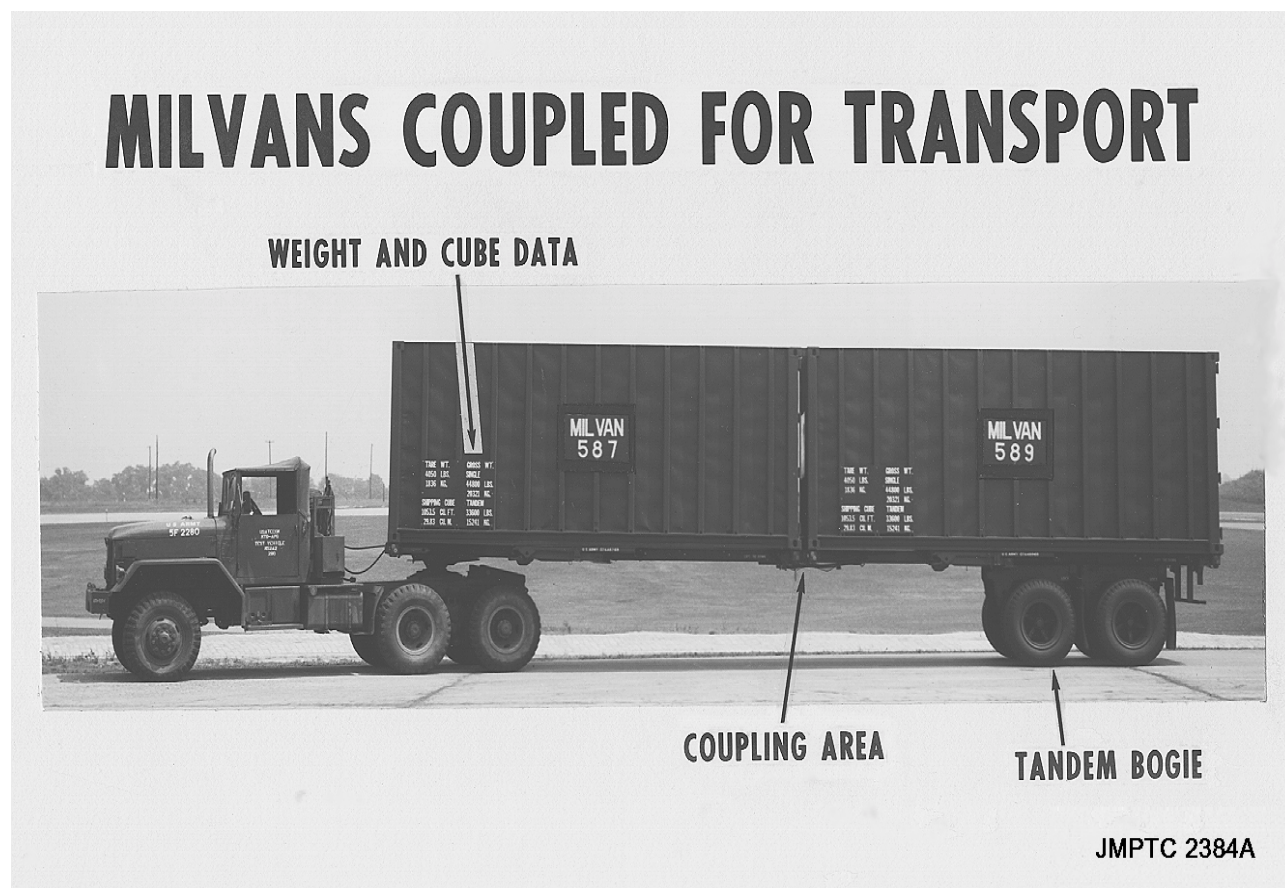


Figure 7-13 MILVAN cargo containers coupled for transport



Figure 7-14 SEAVAN loaded for highway movement

### **Insulated Container**

This is a specialized container. It is used for cargo that should not be subjected to rapid temperature changes. It should be used when extreme changes in ambient temperatures are indicated.

### **Car-carrier**

This specialized container is designed to carry two or four privately-owned vehicles for ocean transportation. The container which carries four vehicles is 35 feet long and has double-deck frames. Due to its additional height, the four vehicle container has one and one-half times the cube capacity of a dry cargo container.

### **Tank Container**

This also is a specialized container. It is a small tank, inclosed in a framework, that can be used for small lot shipments of bulk liquids.

### **Weight Distribution**

Distribute the load evenly throughout the container with heavier items on the bottom.

### **Cargo Must be Compatible With the Size of the Container**

When the density of one commodity is not compatible with the container size, select an adequate commodity mix that will yield the best cube utilization. At least 80 percent of the cube should be used.

### **Weight Limitations**

There are two overall transporter-weight: First, the rated capacity of MILVANS and SEAVANS; and second, the road-weight limitation imposed by the States over which the container must travel by motor vehicle.



## **SHIPMENT OF HAZARDOUS MATERIALS**

Hazardous materials must be compatible with the remainder of the load. Do not stuff food or medical supplies in the same container as insecticides, chemical products, radioactive materials, biological materials, poisons, or toxic materials.

Do not ship noncompatible hazardous materials together.

Pack, mark, label, and placard hazardous materials in strict accordance with Department of Transportation and International Maritime Organization regulations.

The U. S. Coast Guard regulations prohibit certain explosives and other hazardous materials from being shipped in cargo containers.

## **GENERAL RULES FOR STUFFING MILVANS AND SEAVANS**

The general rules discussed below concern the stuffing of general cargo into MILVANS and dry cargo type SEAVANS.

Place heavy items on the bottom of the load, maintaining an even distribution of weight throughout the cargo container.

When stuffing standard 43-inch high modular containers, double-tier them whenever possible. If double-tiering is not possible, top off the load with "fluff cargo" of low density. "Fluff cargo", which must be man-handled, should not exceed 200 pounds per item or pack.

Leave several inches of head space between the top of the load and the top of the cargo container so that the load can be removed easily with a forklift truck.

Pack the load as tightly as practicable. Do not wedge the load or pack it so tightly that problems will occur during unstuffing operations.

Always position palletized or skidded loads to rest on their pallets or skids. Face pallet access slots toward the doors to minimize forklift maneuvering during unstuffing operations.

Never place a heavy crate or box so that it rests on top of, and inside the four corners of the box beneath it. Place dunnage over the lower level of containers when dense loads in the upper tier may cause damage to the containers below.

Place boxes, crates, and cartons, which contain liquids that may leak, on the bottom of the load whenever practicable.

Keep drums that contain petroleum products separated from general cargo. Stow drums with their bungs on top. Pack the drums tightly. When possible, pelletize drums. When not palletized, place strips of dunnage between tiers of drums. Use lumber, burlap, fiberboard or paper, as applicable, to prevent it from shifting during transit. Use dunnage when it is available for filling spacing between large boxes or crates.

A load checker should keep a running account of the weight of individual items being stuffed to ensure the correct total net weight. Enter the overall load weight and cube on the loading list or the Transportation Control Movement Document (TCMD). Brace cargo of average or high density to prevent it from falling out when the container doors are opened.

### **Closing and Sealing MILVANS and SEAVANs**

Place the shipping documents in the space provided on the door. Make sure that both rear doors on MILVANS and SEAVANs are closed by sliding the closure bolts into the holes provided in the body of the cargo containers. Position the door handles over the latches in the doors and attach a numbered railway car seal. MILVANS require that both door latches are provided with a seal.

Make sure that the serial numbers on the seals correspond with the numbers on the shipping documents. Thread the seals through the latches on the doors and snap the seals into the seal locking devices. Use padlocks of approved design on cargo container containing classified material. Be sure that key control measures are provided.

### **Marking of MILVANS and SEAVANs**

Shipment units and shipment units in consolidation will be address marked in accordance with Military Standard MIL-STD-129, Standard Practice for Military Marking. The address markings for MILVANS and SEAVANs shall be accomplished by attaching a waterproofed Military Shipping Label (DD Form 1387) adjacent to the seal, if required, or at the rear of the van. Data for the label will be in conformance with DOD 4500.32R, Military Standard Transportation and Movement Procedures (MILSTAMP) and MIL-STD-129.